

ABSTRACT OF THE DISCLOSURE

A sensor network routing is formulated as a joint optimization problem taking into account routing cost and information aggregation. Information gain is used explicitly to optimize the routing path. The optimization approach involves a shortest path algorithm in a modified network graph. A method is provided that routes queries from an arbitrary entry point to high activity network sensor regions using inputs from sensor nodes along the path to refine the message. The multiple step look-ahead approach provides deadlock avoidance and routing around sensor network holes. For point-to-point query routing, a method based on real-time A* (RTA*) search is provided to find a path which takes detours efficiently to maximize information aggregation. Future information expected to be gained along the path from an arbitrary node to an exit node may be estimated to allow the selection of a successor sensor node.